

**ABSTRACT OF THE DISCLOSURE**

**OPTICAL DEVICE WITH IMMEDIATE GAIN FOR BRIGHTNESS  
ENHANCEMENT OF OPTICAL PULSES**

5

Amplifying optical waveguide devices, which, by combining an instantaneous or nearly instantaneous gain medium with pulsed cladding-pumping can convert the multimode pump pulses to higher-brightness (even single-mode) signal pulses. The operating parameters can be carefully matched to the interaction length of the 10 amplifying optical device to promote efficient conversion. The invention combines attractive features of cladding-pumped waveguide devices such as robustness and good thermal management properties with those of synchronously pumped devices. Thus, the pulse energy of the generated beam is not limited by the energy that can be stored in the gain medium.

15

20